

# ATOMIC ENERGY *newsletter*®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH  
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

April 5th, 1955  
Vol. 13... No. 4

Dear Sir:

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The U. S. will now sell the Italian Government 10 tons of heavy water to be used in Italy's first nuclear research reactor, a USAEC official said in Washington last week. Professor F. Giordani, chairman of the Italian Government's Committee for Nuclear Research, heads the Italian technical mission which is working out the details of the transaction with the USAEC. (The heavy water is being produced by the USAEC's facilities at the Savannah River Plant, and at the Dana, Indiana, facility for use in the reactors at Savannah River.)

A new department for the design, development, manufacture and marketing of atomic power equipment has now been established by General Electric Co., Schenectady, N. Y. It is the 4th department the firm has set up in its atomic products division; others are Knolls Atomic Power Laboratory; Hanford Atomic Products Operation; and the Aircraft Nuclear Propulsion Dep't., Evendale, O. (These latter three, however, are as prime contractor to the USAEC, while the new department is an independent undertaking not involving the USAEC.)

An agreement under which Rio Tinto Mines will now assume the direction and financing of the exploration program at the Mary Kathleen uranium lease, in Queensland, near Mount Isa, Australia, has now been made between Rio Tinto and Australasian Oil Exploration. Assay of the ground has indicated 0.33% uranium oxide from the Mary Kathleen field, in addition to the rare earths cerium-lanthanum showing 13.1%, and yttrium-erbium showing 13.6%, upon assay. (Rio Tinto had recently furnished a large share of the financing for the uranium mineral properties of Algom Mines, Canada.)

A division of licensing has now been set up by the USAEC in Washington; head will be Harold L. Price, former USAEC deputy general counsel. The division will handle the licensing of private atomic energy activities and related matters under the Atomic Energy Act of 1954.

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ATOMIC ENERGY BUSINESS REPORTS...

ELECTRIC UTILITY APPLIES FOR GOVERNMENT PERMISSION TO ERECT NUCLEAR POWER PLANT:- Consolidated Edison Co., New York utility which had previously stated its intention to erect what will be the first U.S. privately financed nuclear powered electric utility (this LETTER 2/22/55), has now made formal application to the USAEC. The utility also revealed that of the three proposals it had solicited for construction of the reactor and associated equipment, it had awarded a contract to Babcock & Wilcox Co., in preference to General Electric Co., and Westinghouse Electric, the other firms submitting bids. Babcock & Wilcox will furnish a pressurized water thorium-uranium converter reactor for the plant. Among features of the B & W equipment will be an oil fired superheater, conforming to best present engineering practice in steam operation. B & W estimated the capacity of the plant to be 236,000 kw. of electricity. H.R. Searing, Con Edison president, has estimated 4 years for completion of the plant which will be built at Indian Point, in the village of Buchanan, N.Y., at an overall cost of \$55,000,000. (The site had been selected after test borings revealed a rock strata of considerable depth, since it is intended to blast a housing out of the rock for the nuclear reactor. This will provide a large measure of safety and reduce insurance premiums for the utility, because of this safety factor.)

PLANS ANNOUNCED FOR CANADIAN NUCLEAR POWER PLANT: Canada's first nuclear utility is now planned for Ontario, according to Canadian Trade Minister Howe. Formal arrangements have now been made between Canadian General Electric Co., the Ontario Hydroelectric Commission, and the federally owned Atomic Energy of Canada, Ltd., to jointly construct and operate a \$15 million experimental plant near Chalk River, which is the center of Canada's nuclear work. It is estimated that the plant will produce 20,000 kw. of electrical energy.

FIRMS SEEK BUSINESS POTENTIALS IN NUCLEAR WORK:- New business potentials in the nuclear field are now being investigated by General Dynamics Corp., New York; Baldwin-Lima-Hamilton Corp., Phila.; and Denver & Rio Grande RR, Denver. The studies will be made under the Industrial Participation Program of the USAEC.

General Dynamics, in its study, will investigate nuclear power equipment such as small power reactors and specially designed components of reactor systems with a view to manufacturing such products. The company will also study problems of decontamination services, use of by-product radiation, instrumentation, waste disposal, and the materials and equipment required to handle these problems. The USAEC will make available the reactor technology already developed, and will provide consultation services of its people and of contractor people as required.

Baldwin-Lima-Hamilton, and the Denver & Rio Grande RR, who will conduct a joint study, will weigh the engineering, technical and economic aspects of a nuclear-powered reciprocating engine. This is a combined effort of a leading locomotive manufacturer and a progressive railroad. People from the firms, properly cleared, will be given access by the USAEC to sources of technical information on the subject, and will be shown developments already made along their lines of interest. Consultation services of the USAEC and USAEC-contractor people will be furnished to the firms.

CITIZEN'S PANEL SET UP BY JOINT CONGRESSIONAL COMMITTEE ON ATOMIC ENERGY:- An 8-citizen group has now been established by the Joint Congressional Committee on Atomic Energy to study the impact of the peaceful uses of atomic energy on all phases of U. S. life. (A similar panel last year was appointed by the Joint Committee to look into the military aspects of the atomic energy program.) Heading this new group will be Robert McKinney, editor and publisher, Santa Fe New Mexican. Others are E. R. Breech, chairman, Ford Motor Co., G. R. Brown, partner, Brown & Root, Houston, Tex., construction firm; S. C. Dows, chairman, Iowa Light & Power Co.; J. R. Dunning, dean of engineering, Columbia University, New York; F. M. Folsom, president, Radio Corp. of America; T. Keith Glennan, president, Case Institute of Technology, Cleveland, and Samuel B. Morris, general manager and chief engineer, Los Angeles Department of Water & Power.



NEW PRODUCTS, SERVICES & INSTRUMENTS...for lab & plant...

PRODUCTS FROM MANUFACTURERS:- Model 2613 is a new instrument developed for uranium mineral prospecting. The instrument achieves good sensitivity by its use of a cluster of ten Geiger tubes. The manufacturer states that changes in radioactivity of the order of 0.001 mr/hr can be read. Radiation intensities of 0.02; 0.2; and 2 mr/hr full scale are shown on the meter. A special 900-volt stabilized audio oscillator high voltage supply for the Geiger tubes is said to provide battery life of over 250-hours when operated continuously, or an equivalent of the battery's shelf life when used 2-hours daily. --Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

Model 5010 is a general purpose scintillation sample counting assembly for counting gamma radiation from samples of gamma-emitting material. The assembly has an automatic scaler supplied as a standard component, which has automatic timing and 5-microsecond resolution. The scintillation detector in this unit has a well crystal for receiving test tube samples, shielded against background radiation. Suggested uses for the assembly include activation analysis, tracer chemistry identification and research studies, clinical examination of blood and tissue samples, and distribution studies of trace elements in plant structure. --Atomic Instrument Co., Cambridge 39, Mass.

Model CRM-560 is a precision count rate meter with a range of from 5 to 10,000 counts per second full scale. The instrument incorporates a sensitive linear amplifier and discriminator, with two millivolt sensitivity. High voltage is variable over a range of 750 to 2000-volts and is indicated on a four inch meter, while the count rate is shown on a separate meter so that both values are visible at all times. --NRD Instrument Co., St. Louis 14, Mo.

SERVICES OF PRIMARY SUPPLIERS:- A new film badge service is now offered for personnel monitoring where neutron exposure is a hazard. The service supplies new nuclear track films to each user weekly, and processes, reads, and reports on the films. (The determination of neutron exposure is by counting proton recoil tracks in the nuclear track emulsions of the films.) This service uses the exclusive quick-change badge which is a feature of its beta-gamma film badge service. --R. S. Landauer, Jr., & Co., Park Forest, Ill.

NOTES:- A firm order for a 6-million electron volt particle accelerator has now been received by High Voltage Engineering Corp., Cambridge, Mass., from the U. K. Atomic Energy Authority. The machine will be installed at the Authority's atomic weapons research establishment, Aldermaston, (Berks.) England, and used for basic research by the nuclear physics branch there. Cost to the Authority, including accessories and equipment, will be \$402,700.

A periscopic, stereoscopic telescope, designed and built by E. Leitz, Inc., New York, has now been placed in operation at the USAEC's Knolls Atomic Power Laboratory, Schenectady, N. Y. One of the first of its kind, the device enables observers to see and then to photograph three-dimensional pictures of radioactive materials.

A new brochure describing this firm's radiography equipment using radioisotopes is now available from Technical Operations, Inc., Arlington 74, Mass.

Now offered by Leeds & Northrop Co., Philadelphia, is what the firm states is the first complete "package" system for nuclear reactor control. The "package" includes complete design, instrumentation, and fabrication of such control systems. Advantage of such service is said to be use of standard L & N components, eliminating much custom fabrication.

An operating nuclear research reactor will be built and operated by the USAEC for demonstration purposes at the U. N. International Atomic Conference, Aug. 8-20, 1955. Purpose is to demonstrate to visiting physicists and technicians a reactor which provides excellent facilities for a variety of cross-section measurements; experiments with neutrons and gamma rays, including shielding studies; and production of radioisotopes. Fuel used will be the type other nations can draw from the 100 kilograms of uranium-235 the U. S. is making available to such nations for use in research reactors. This is fuel grade uranium enriched in isotope-235 to about 20%. About 5-kilograms of uranium-235 will be required. The reactor will be the "swimming pool" type, so-called because the entire reactor is immersed in a tank 10 feet in diameter and 20 feet deep, filled with water. Cost is placed at \$550,000.

NUCLEAR POWER INDUSTRY DEVELOPMENT; Talk by W. Kenneth Davis, Dir., Div. of Reactor Dev., USAEC, at 17th Annual Meeting of American Power Conference, Chicago, Ill., on Apr. 1, 1955. (Condensed for readers of this LETTER.)

There is now no question as to the technical feasibility of nuclear fission as a heat source for the generation of electric power; for propulsion; or for processing and space heating. Our real question is not whether we can utilize nuclear energy, but when and how we will utilize it.

Nuclear Power Economics: From the USAEC's point of view, the first goal is at least one reactor which is economically competitive with conventional power plants, at least in some areas of the U.S.

And recently, industrial groups examining the cost of construction of "nuclear boilers" have foreseen much lower costs than previously. Costs as low as \$80 to \$100 per kw. of capability for the reactor, including the first core ("nuclear boiler") have been estimated for nuclear power plants of 75,000 to 150,000 kw. of electrical capability. While this is still substantially more than the \$40 to \$70 per kw. for conventional boilers of the same size, it is definitely encouraging.

I believe that nuclear power can compete with and even be produced at lower cost than power from conventional fuels if its development is carried out on a sound basis.

Initial Expansion: At which stage will the nuclear power industry start to expand? The expansion of nuclear power depends upon the degree of confidence of the producers of power and the manufacturers of equipment in the eventual achievement of economic nuclear power rather than upon its actual achievement at the time of investment. This confidence will increase as industrial workers convert scientific and technological data developed in the laboratories into practical machines and processes.

Expansion Rate: A speculation I made in the Fall of 1952 foresaw a transition based on new power plant construction. At that time I assumed that the U.S.'s total power production capability would expand at the rate of 6% per year. I further assumed that 10% of the new capacity going into use in 1962 would be nuclear, and that this percentage would increase by 2% annually.

On the basis of my experience since 1952, I now believe that the transition to nuclear power will be rapid rather than slow--more rapid than the figures quoted. Once the transition really begins, I feel it will "snowball".

I envision three phases in this transition to nuclear power. (1) Some fairly large nuclear plants will be built, largely with private funds, but with Government assistance. (2) At some point in time--largely a psychological point--the degree of confidence in the economic advantages of nuclear power will become so strong that a relatively large proportion of new power plants will be nuclear. At this point, the proportion of nuclear power plants to the total number being built might increase from perhaps 5% to 60% in 10 years or less. (3) When the proportion of new nuclear power plants reaches this 60 to 70%, further growth will be a matter of slow saturation.

Size of Nuclear Power Industry: I estimate we should have about 2,000,000 kw. of nuclear power capability in service by the end of 1960; about 5,000,000 kw. by the end of 1965; about 27,000,000 kw. by the end of 1970; about 83,000,000 kw. by the end of 1975; and about 175,000,000 kw. by the end of 1980--which is 25 years from now.

If these predictions come to pass, the U.S. by 1977 will have about 100,000,000 kw. of electrical generating capability in nuclear power plants--about as much as it now has in conventional generating plants. These nuclear plants would probably represent an investment of nearly \$20 billion.

When one thinks of the various new facilities and plants necessary to supplement and service such a large nuclear power capacity, it is obvious that there will be many opportunities for large and small industries to make a place for themselves in this business during the next 20 years.

This is important: expansion of nuclear power will be based on confidence in the future of nuclear power rather than on an actual demonstration of the production of electricity from uranium and thorium at competitive rates.

ATOMIC ENERGY FINANCIAL REPORTS...

STOCK ISSUE TO FINANCE DEVELOPMENT WORK:- Electronized Chemicals Corp., Brooklyn, N.Y., has now obtained some \$180,000 by a public offering recently made of 24,000 shares of the company's common stock. (The company has under construction a prototype radiation generator whose efficiency it believes is greater than that of other existing equipment. High voltage electrons are produced by charging banks of high voltage condensers in parallel from a direct current source, and then discharging them in series through a suitable gas discharge tube.) Electronized holds approximately 100 U. S. and foreign patents, one of which is believed to be fundamental to the pulse method of sterilization used in its device and in microwave linear accelerators. Funds from this new stock issue will be used to conduct experimental work. Some \$700,000 of private funds have been spent so far by directors and executive officers of the firm on experimental work.

INVESTMENT COMPANY SHOWS ASSET GAIN:- Atlas Corp., investment company specializing in "special situations", and which recently bought several large U. S. uranium ore properties, had a net asset value of \$45.77 a share last December 31st, Floyd B. Odum, president, says in the firm's annual report. This compares with assets of \$37.82 a share on Dec. 31, 1953.

ENGINEERING FIRM FOLLOWS CONSERVATIVE NUCLEAR SPENDING POLICY:- Earle W. Mills, president, Foster-Wheeler Corp., told stockholders at the annual meeting last week in New York that he had not the desire or authorization to spend the firm's money in taking nuclear energy contracts at prices below those required to recover overhead and out-of-pocket expenses. He said however that he was willing to spend modest sums in nuclear research. Foster-Wheeler, he noted, has orders on its books for the first two months of 1955 totaling \$20,550,000; this is double its bookings for the first two months of 1954. (The firm designs, manufactures, and installs refinery and chemical plants, and projects in allied fields.)

ANALYSES MADE AVAILABLE:- Reviews of firms active in nuclear work are available on request from McDonnell & Co., 120 B'way, NYC, who analyze Union Carbide & Carbon; from Halle & Stieglitz, 52 Wall St., NYC, who consider Harshaw Chemical Co., and from Burnham & Co., 15 Broad St., NYC 5, who analyze Rio Tinto Mines.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Development, Growth & State of Atomic Energy Industry. Hearings held by 84th Congress, 1st session, Jan. 31-Feb. 10, 1955. Two parts, each 55¢. 426 pages. Order as No. Y4. At 7/2: At 7/12/pt. 1-2..... Blast Damage from Nuclear Weapons of Larger Sizes. Prepared by Federal Civil Defense Administration. 5¢. Order as No. FCD 1.3:8-1..... Basic Course for Civil Defense. Publication of FCDA. Order as No. FCD 1.6/5:3-2. --Superintendent of Documents, Washington 25, D.C.

Testimony on Atomic Energy. Brochure prepared by General Electric Co. covering testimony of F. K. McCune, G-E's manager of its atomic products div., before Joint Committee on Atomic Energy, Mar. 3, 1955. --General Elec. Co., Schenectady 5, N.Y. (n/c)

Gamma Ray Sources & Techniques for Gamma Ray Radiography. Work done at U. S. Naval Ordnance Laboratory, White Oak, Md., by J. J. Hirschfield, D. T. O'Connor, and D. Polansky. Order as No. PB-116148. (Microfilm, \$4.00; Photocopy \$11.50).....

Utilization of Gross Fission Products. Summary report for period Feb. 1, 1952-June 30, 1954. Report of investigations conducted by American Meat Institute Foundation, at Univ. of Chicago. No. AECU-2951. (Microfilm, \$3.00; Photocopy \$7.75)..... Survey Meter for Uranium & Plutonium. Work done at Savannah River Plant, Nov., 1954 (Microfilm \$2.00; Photocopy \$2.75) --Library of Congress, Publication Bd. Project, Washington 25, D.C.

NOTES:- Under a new program of University Microfilms, Ann Arbor, Mich., this LETTER and other pub., will be available to subscribers on microprint cards, as well as on microfilm. (This LETTER has been available on microfilm, to its subscribers only, for several years.)

Sincerely,

The Staff,  
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